

*Observations of the Companion of Sirius made at the Dearborn Observatory, Chicago, U.S.A. By Prof. G. W. Hough, Director.*

(Communicated by the Secretaries.)

Date.	Sid. Time. h	<i>p.</i>	<i>s.</i>	Remarks.
1887·118	5·9	24·7	—	High winds. Unsteady.
·148	6·6	24·4	6·90	Difficult.
·186	7·5	23·7	clouded	Comp. plain.
·211	7·2	23·7	6·80	Difficult.
·217	7·5	23·2	6·77	Comp. plain. Vis. with 925 power.
·236	8·0	23·1	6·65	Difficult. Clouds passing.
·249	7·8	23·3	6·77	Difficult. Hazy.

Mean Results.

1887·195	23·7	6·78
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During the past spring the weather here has been very unfavourable. It is the first year that I have found any difficulty in securing observations of *Sirius* on as many nights as was desirable. The decrease in the distance, however, makes the observation of this pair more difficult every year, and hence requires better atmospheric conditions than formerly.

*On the Orbit of  $\Sigma$  1757. By J. E. Gore.*

A reference to my paper on the orbit of this binary star in the *Monthly Notices* for November 1886 will show that the comparison between the measures of position angles in recent years and the angles computed from the elements there given is not satisfactory. I have re-computed the orbit, using recent measures kindly made for me by Mr. Tarrant and Prof. Young (U.S.A.), and now find the following elements:—

*Second Elements of  $\Sigma$  1757.*

$P = 276·92$ years	$\varpi = 87^\circ 36'$
$T = 1791·98$ A.D.	$\lambda = 185^\circ 23'$
$e = 0·4498$	$a = 2·05''$
$\gamma = 40^\circ 56'$	$\mu = +1·30^\circ$

The following is a comparison between the observations and the positions computed from the above elements:—

June 1887.

Orbit of  $\Sigma$  1757.

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Epoch.	Observer.	$\theta_0$	$\theta_c$	$\theta_0 - \theta_c$	$\rho_0$	$\rho_c$	$\rho_0 - \rho_c$
1825.37	Struve	10.0	10.47	-0.47	1.60	1.26	+0.34
1829.82	"	19.5	19.57	-0.03	1.44	1.37	+0.07
1832.39	Smyth	24.1	24.19	-0.09	1.5	1.44	+0.06
1833.38	Struve	23.9	25.83	-1.93	1.54	1.46	+0.08
1835.37	"	25.5	29.03	-3.53	1.66	1.51	+0.15
1836.42	"	29.4	30.67	-1.27	1.64	1.53	+0.11
1838.48	Smyth	31.0	33.62	-2.62	1.7	1.58	+0.12
1841.38	Mädler	36.0	37.48	-1.48	1.74	1.66	+0.08
1842.39	Dawes	37.4	38.72	-1.32	1.67	1.69	-0.02
1842.52	Smyth	37.9	38.89	-0.99	1.7	1.69	+0.01
1843.45	Dawes	38.8	40.00	-1.2	—	1.70	—
1843.51	Kaiser	40.9	40.07	+0.83	—	1.71	—
1844.72	O. Struve	43.7	41.50	+2.20	1.89	1.74	+0.15
1845.88	Mädler	40.8	42.77	-1.97	2.02	1.77	+0.25
1850.38	O. Struve	48.8	47.43	+1.37	1.85	1.89	-0.04
1852.38	Smyth	51.7	49.25	+1.45	2.0	1.94	+0.06
1853.09	Mädler	52.2	49.98	+2.22	2.05	1.96	+0.09
1853.73	Jacob	48.0	50.54	-2.54	2.14	1.98	+0.16
1854.37	Mädler	50.1	51.10	-1.00	2.16	1.99	+0.17
1855.31	"	51.3	51.96	-0.66	1.7	2.01	-0.31
1856.32	"	51.8	52.80	-1.00	1.5	2.04	-0.54
1856.42	Morton	51.9	52.89	-1.01	2.01	2.04	-0.03
1856.88	Secchi	52.9	53.27	-0.37	1.84	2.05	-0.21
1857.29	Morton	54.2	53.61	+0.59	2.00	2.06	-0.06
1858.08	Jacob	52.8	54.24	-1.44	1.76	2.07	-0.31
1858.37	Mädler	54.7	54.47	+0.23	1.91	2.08	-0.17
1859.36	"	53.7	55.24	-1.54	1.82	2.11	-0.29
1860.34	Dawes	54.3	56.03	-1.73	2.31	2.13	+0.18
1860.35	"	53.4	56.03	-2.63	2.08	2.13	+0.05
1863.32	Dembowski	59.0	58.23	+0.77	2.01	2.20	-0.19
1865.97	"	60.4	60.06	+0.34	2.09	2.25	-0.16
1866.01	O. Struve	60.8	60.09	+0.71	2.34	2.25	+0.09
1867.27	Talmage	63.7	61.00	+2.70	2.60	2.28	+0.32
1868.30	Dembowski	62.7	61.65	+1.05	2.04	2.30	-0.26
1869.22	Brünnow	63.4	62.25	+1.15	2.59	2.32	+0.27
1869.24	Talmage	64.3	62.25	+2.05	—	2.32	—
1870.15	Dembowski	63.5	62.87	+0.63	2.03	2.34	-0.31
1870.37	Talmage	64.1	63.00	+1.10	2.00	2.34	-0.34
1871.19	Dembowski	63.4	63.52	-0.12	2.13	2.35	-0.22

Epoch.	Observer.	$\theta_o$	$\theta_c$	$\theta_o - \theta_c$	$\rho_o$	$\rho_c$	$\rho_o - \rho_c$
1872.33	Wilson & Seabroke	64.8	64.25	+0.55	2.30	2.37	-0.07
872.37	Talmage	67.3	64.27	+3.03	—	2.37	—
1873.23	Wilson & Seabroke	64.0	64.80	-0.80	2.05	2.38	-0.33
1873.35	„	65.0	64.87	+0.13	2.00	2.38	-0.38
1874.32	„	65.5	65.45	+0.05	2.15	2.40	-0.25
1874.32	Talmage	69.8	65.45	+4.35	1.08?	2.40	-1.32?
1874.41	Wilson & Seabroke	64.2	65.50	-1.30	2.16	2.40	-0.24
1875.31	Schiaparelli	66.6	66.03	+0.57	2.00	2.42	-0.42
1876.36	Wilson & Seabroke	67.2	66.64	+0.56	2.15	2.44	-0.29
1876.41	„	66.5	66.67	-0.17	2.21	2.45	-0.24
1879.40	Hall	68.9	68.40	+0.50	2.33	2.50	-0.17
1879.470	Schiaparelli	67.98	68.40	-0.42	2.462	2.50	-0.038
1882.467	„	69.38	70.00	-0.62	2.314	2.55	-0.236
1883.21	Engelmann	70.44	70.43	+0.01	2.623	2.56	+0.063
1887.213	Tarrant	72.44	72.52	-0.08	2.62	2.62	0.00
1887.356	Young	72.75	72.59	+0.16	2.79	2.62	+0.17

I have computed the following short ephemeris:—

Date.	Position Angle.	Distance.
1890.0	73.91°	2.73"
1895.0	76.32	2.78
1900.0	78.64	2.83

*On the Formulae for Correcting Approximate Elements of the Orbits of Binary Stars.* By A. Marth.

The present communication, a supplement of the paper in the April number of the *Monthly Notices*, pp. 333-46, is intended to point out the alterations and modifications of the formulæ there given, which render them applicable to the orbits of binary stars, and to offer some remarks connected therewith.

While in the case of the orbit of a satellite belonging to the solar system the apparent orbit, or the projection of the true orbit on a plane perpendicular to the line of vision, changes continually with the changing position of the Earth relative to the planet, in the case of a binary system the plane of projection remains unaltered, and may therefore properly be adopted as the plane to which the plane of the orbit is referred.

Let  $\Omega_0$  denote the position-angle of the line of nodes of the two planes, reckoned from the declination-circle passing through the star at the time  $t_0$ ,  $\Omega$  the same angle reckoned from the declination-circle at the time  $t$ , so that

$$\Omega = \Omega_0 + 0^{\circ}.00557 \sin \alpha \cdot \sec \delta \cdot (t - t_0).$$